

CLAIMSWhat is Claimed:

1. In a mobile station storing a list of wireless communications systems, a system acquisition procedure comprising the steps of:

maintaining system priority data, the system priority data including a first plurality of system identifiers and corresponding priority criteria;

selecting a group of wireless communications systems from the list in accordance with a predetermined system selection procedure, the group of wireless communications systems having a first system acquisition order;

reprioritizing the group of wireless communications systems in accordance with the system priority data, the reprioritized group of wireless communications systems having a second system acquisition order; and

attempting to acquire the wireless communications system in the group of wireless communications systems that has the highest priority.

2. The method of Claim 1 wherein the list of wireless communications systems is a preferred roaming list including a geographic region identifier,

wherein the step of selecting a group of wireless communications systems comprises the steps of:

determining a current geographic region of the mobile station; and

searching the preferred roaming list for wireless communications systems having a geographic region identifier that corresponds to the current geographic region of the mobile station, and

wherein the first system acquisition order is dictated by the relative order of the selected wireless communications systems in the preferred roaming list.

3. The method of Claim 2 wherein each wireless communications system identified in the preferred roaming list has a corresponding desirability level and at least two of the selected systems share the same level of desirability.

4. The method of Claim 3 wherein the step of reprioritizing comprises the steps of:  
2 locating selected systems that share the same desirability level; and  
sorting the located systems using the priority criteria.

5. The method of Claim 3 wherein the step of reprioritizing comprises the steps of:  
for each selected system, adjusting the corresponding desirability level if the  
corresponding priority criteria exceeds a first threshold, the adjusted desirability criteria being  
4 stored in the group of wireless communications systems; and  
6 sorting the group of wireless communications systems using the adjusted desirability  
levels.

6. The method of Claim 3 wherein the step of reprioritizing comprises removing a  
2 selected system from the group if its corresponding priority criteria exceeds a second threshold.

7. The method of Claim 1 wherein the step of maintaining further comprises the  
2 steps of:  
detecting a communications event for a currently selected wireless communications  
4 system, the currently selected wireless communications system having a corresponding system  
identifier; and  
6 updating an entry in the system priority data to reflect the occurrence of the detected  
communications event, the updated entry including the corresponding system identifier.

8. The method of Claim 7 wherein detectable communications events include system  
2 acquisition failures and system access failures.

9. The method of Claim 7 wherein the corresponding system identifier includes a  
2 mode and a frequency.

10. The method of Claim 7 wherein the step of updating further comprises calculating  
2 an occurrence rate of the detected event for the currently selected wireless communications  
system and storing the calculated occurrence rate.

11. The method of Claim 10 wherein the detected event is a successful signal  
2 acquisition and the calculated occurrence rate is a signal acquisition success rate.

12. The method of Claim 10 wherein the detected event is a failed system access  
2 attempt and the calculated occurrence rate is a system access failure rate.

13. The method of Claim 1 wherein the step of reprioritizing comprises sorting the  
2 group of wireless communications systems in accordance with the priority criteria.

14. The method of Claim 1 wherein, if the attempted system acquisition and access  
2 fails, the step of attempting is repeated with the listed system having the next highest priority in  
the group.

15. In a mobile station, a method for maintaining system priority data comprising the  
2 steps of:

detecting a communications event for a currently selected wireless communications  
4 system, the currently selected wireless communications system having a corresponding system  
identifier; and

6 updating an entry in the system priority data to reflect the occurrence of the detected  
communications event, the entry including the corresponding the system identifier.

16. The method of Claim 15 wherein detectable communications events include  
2 system acquisition failures and system access failures.

17. The method of Claim 15 wherein detectable communications events include  
2 successful system acquisitions, successful system accesses and signal power measurements.

18. The method of Claim 15 wherein the step of updating further comprises  
2 calculating an occurrence rate of the detected event for the currently selected wireless  
communications system and storing the calculated occurrence rate.

19. The method of Claim 15 wherein each entry in the system priority data includes a  
2 timestamp and wherein the entries in the system priority data are deleted after a certain duration  
of time.

20. The method of Claim 15 wherein the step of updating further comprises  
2 calculating a priority metric based on a plurality of priority criteria, the priority metric  
representing the likelihood that an attempt to acquire and register with a corresponding wireless  
4 communications system will be successful.

21. A mobile station comprising:  
2 a memory storing a preferred roaming list, the preferred roaming list including a  
first plurality of system identifiers and corresponding acquisition parameters; and  
4 processing circuitry adapted to create and maintain system priority data, the  
system priority data being stored in the memory and including a second plurality of system  
6 identifiers and corresponding priority criteria,  
wherein the processing circuitry is further adapted to detect a communications  
8 event for a currently selected wireless communications system and update an entry in the system  
priority data to reflect the occurrence of the detected communications event.

22. The mobile station of Claim 21 wherein the processing circuitry comprises:  
2 a system determination unit adapted to select wireless communications systems  
from the preferred roaming list in accordance with a predetermined system selection procedure,  
4 the selected wireless communications systems have a corresponding system acquisition order,  
wherein the system determination unit is further adapted to modify the system  
6 acquisition order based on the system priority data, the modified system acquisition order  
increasing the efficiency of the system acquisition process.

23. The mobile station of Claim 22 wherein the selected wireless communications  
2 systems include corresponding desirability criteria, and  
wherein the system determination unit is further adapted to adjust the  
4 corresponding desirability criteria of a selected system if the corresponding priority criteria  
exceeds a first threshold and sort the selected wireless communications systems using the  
6 adjusted desirability criteria.

24. The mobile station of Claim 23 wherein the processing circuitry is further adapted  
2 to measure the power of a received signal corresponding to the currently selected wireless  
communications system and store the measured power in the system priority data.

25. The mobile station of Claim 23 wherein the processing circuitry is further adapted  
2 to calculate the signal to noise ratio  $E_c/I_o$  of a received signal corresponding to the currently  
selected wireless communications system and store the calculated signal to noise ratio  $E_c/I_o$  in the  
4 system priority data.